CLAIMS

WHAT IS CLAIMED IS:

1. A method of aligning a first waveguide and a second waveguide, the first and second waveguides each having a core, the first and second waveguides comprised of dissimilar materials, the method comprising:

applying a first alignment dot to an end surface of the core of the first waveguide;

applying a second alignment dot to an end surface of the core of the second waveguide;

positioning the first alignment dot in proximity to the second alignment dot; and

melting the first and second alignment dots together.

2. The method of claim 1, wherein the first waveguide is an optical fiber.

3. The method of claim 1, wherein the second waveguide is a planar waveguide.

4. The method of claim 1, wherein applying the first alignment dot to an end surface of the core of the first waveguide further comprises:

applying a photo sensitive optical material to an end surface of the first waveguide;

exposing the photo sensitive optical material to a light beam traveling through the core of the first waveguide, the light beam having a wavelength that cures the photo sensitive optical material to create a first portion of the photo sensitive optical material that is cured and a second portion of the photo sensitive optical material that is not cured;

removing the second portion of the photo sensitive optical material that is not cured.

5. The method of claim 4, wherein removing the second portion of the photo sensitive optical material that is not cured further comprises:

using a solvent to remove the second portion of the photo sensitive optical material that is not cured.

6. The method of claim 4, wherein removing the second portion of the photo sensitive optical material that is not cured further comprises:

using an etch to remove the second portion of the photo sensitive optical material that is not cured.

7. The method of claim 1, wherein applying the first alignment dot to an end surface of the core of the first waveguide further comprises:

applying a mask to an end surface of the first waveguide;

ablating a portion of the mask by exposing the mask to a high energy light beam traveling through the core of the first waveguide to create a mask opening; and

filling the mask opening with an optical material to form the first alignment dot.

8. The method of claim 7 further comprising:

removing the mask from the end surface of the first waveguide.

9. The method of claim 1, wherein the first alignment dot comprises a polymer, a sol-gel, or a glass.

10. The method of claim 1 further comprising:

using alignment dots to align an array of optical waveguides.

11. A method of aligning an optical fiber to a planar waveguide, the optical fiber and the planar waveguide each having a core, the method comprising:

applying a first alignment dot to an end surface of the core of the optical fiber;

applying a second alignment dot to an end surface of the core of the planar waveguide;

coupling the first alignment dot to the second alignment dot; and

melting the first and second alignment dots together.

12. The method of claim 11 further comprising:

allowing the optical fiber or the planar waveguide to move while melting the first and second alignment dots together.

13. The method of claim 12 further comprising:

applying an additional bonding agent between or around the optical fiber and the planar waveguide.

14. The method of claim 11, wherein the first alignment dot comprises a polymer, a sol-gel, or a glass.

15. The method of claim 11, wherein the second alignment dot comprises a polymer, a sol-gel, or a glass.

16. A method of aligning a first waveguide and a second waveguide, the first waveguide having a core, the core of the first waveguide having a first alignment dot attached to it, the second waveguides having a core, the core of the second waveguide having a second alignment dot attached to it, the first and second waveguides having different cross-sectional shapes, the method comprising:

positioning the first alignment dot in proximity to the second alignment dot; and

melting the first and second alignment dots together.

17. The method of claim 16 further comprising:

allowing the first waveguide or the second waveguide to move while melting the first and second alignment dots together.

18. The method of claim 17 further comprising:

applying a bonding agent over the first and second alignment dots to better adhere the first and second waveguides together.

19. The method of claim 17 further comprising:

applying a curable polymer over the first and second alignment dots to better adhere the first and second waveguides together.

20. The method of claim 17 further comprising:

using alignment dots to align multiple waveguides at substantially the same time.

21. The method of claim 20 further comprising:

using the alignment dots to align a fiber ribbon.

22. A method of forming a self-aligning alignment dot on an end surface of a waveguide, the method comprising:

applying a mask to an end surface of the waveguide;

ablating a portion of the mask by exposing the mask to a high energy light beam traveling through the waveguide to create a mask opening; and

filling the mask opening with an optical material.

23. The method of claim 22 further comprising:

removing the mask from the end surface of the waveguide.

24. The method of claim 22, wherein ablating a portion of the mask further comprises:

ablating the portion of the mask with an ablating light.

25. The method of claim 24 further comprising:

coupling an optical probe to the waveguide to provide the ablating light.

26. The method of claim 25 further comprising:

positioning the optical probe in a probe region above the waveguide, the probe region having a waveguide upper cladding that has been at least partially removed.

27. The method of claim 25 further comprising:

positioning the optical probe in a probe region above the waveguide, the probe region having an upper cladding of approximately 0-3 microns.

28. The method of claim 25, wherein the ablating light is an UV light.

29. The method of claim 22, wherein the waveguide is an optical fiber.

30. The method of claim 29 further comprising:

aligning a far end of the optical fiber to a light source;

forming the self-aligning alignment dot on an opposite end of the optical fiber;

cutting off a segment of optical fiber with the self-aligning alignment dot; and

forming another self-aligning alignment dot on the opposite end of the optical fiber without re-aligning the far end of the optical fiber.

31. The method of claim 22, wherein the waveguide is a planar waveguide.

32. The method of claim 22, wherein the optical material comprises a polymer or a sol-gel.

33. A method of forming a self-aligning alignment dot on an end surface of a waveguide, the method comprising:

applying a photo sensitive optical material to an end surface of the waveguide;

exposing the photo sensitive optical material to a light beam traveling through the waveguide, the light beam having a wavelength that cures the photo sensitive optical material to create a cured portion of the photo sensitive optical material and an uncured portion of the photo sensitive optical material; and

removing the uncured portion of the photo sensitive optical material.

34. The method of claim 33, wherein removing the uncured portion of the photo sensitive optical material further comprises:

using a solvent to remove the uncured portion of the photo sensitive optical material.

35. The method of claim 34, wherein removing the uncured portion of the photo sensitive optical material further comprises:

using an etch to remove the uncured portion of the photo sensitive optical material.

36. The method of claim 33 further comprising:

coupling an optical probe to the waveguide to provide the light beam traveling through the waveguide.

37. The method of claim 33, wherein the waveguide is an optical fiber.

38. The method of claim 37 further comprising:

aligning a far end of the optical fiber to a light source;

forming the self-aligning alignment dot on an opposite end of the optical fiber;

cutting off a segment of optical fiber with the self-aligning alignment dot; and

forming another self-aligning alignment dot on the opposite end of the optical fiber without re-aligning the far end of the optical fiber.

39. The method of claim 37, wherein the waveguide is a planar waveguide.

40. The method of claim 33, wherein the photo sensitive optical material comprises a polymer or a sol-gel.